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DOE Rooftop 1 Challenge
Efficient Solar Market Partners of Northern California Successes
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Grant Period February 2012-13, Final Report Narrative

Contents

Summary

The SolarTech Efficient Solar Market Partners of Northern California (ESMP) RSC 1 program and team comprised of Solar Sonoma County, East Bay Green Corridor, Clean Coalition and the City and County of San Francisco comprising 19 local jurisdictions, a population of 2,107,048, and 58 megawatts (MW) of residential and commercial solar installations to date (8.4% of California CSI program total as of 8/4/2011). The various members of the team focused on a variety of developments in model practices and awareness development to address improvements in Permitting, Inspection, Interconnection, Finance, and Customer Acquisition. Success highlights include:

- Streamlined permitting across all of San Francisco and Sonoma Counties.
- Streamlined permitting across nine jurisdictions in the East Bay, including 7 cities in Alameda County and 2 in Contra Costa County totaling over 950,000 residents (EBGC).
- Agreement with the Contra Costa RSC 1 team to merge processes across all of Contra Costa county and Sonoma county in 2013.
- Model programs for driving consumer awareness, protection and demand.
- Training and awareness development for commercial and residential PACE programs.
- Several financial guides on the various solar financing and group-buy options
- Streamlined interconnection case study from PG&E
- Interconnection Business Practices Guide for any utility category
- Interconnection "Rule 21" Lite for municipal utilities
- Build out of websites at Solar Sonoma County, East Bay Green Corridor and San Francisco describing the new developments for solar
- Innovative structural guidelines covering pre 1950 residential structures eliminating costly and time-consuming engineering assessments completely (EBGC)
- Several traditional classroom training events focused installer and building official code training in Sonoma County and EBGC.
- Three symposiums and nine webinars building broader community awareness of the developments of this program in all aspects
- Oversaw an increase of 10% in the Market Adoption ranking.
- During the course of the grant period, 19.7 megawatts (MW) were added for a total of 78.3MW installed capacity across the 18 of the 19 participating jurisdictions[1] (Albany, Berkeley, Sonoma, Sonoma County, Cloverdale, Cotati, Sebastapol, Windsor, El Cerrito, Emeryville, Healdsburg, Oakland, Petaluma, Richmond, Rohnert Park, San Leandro, San Francisco, and Santa Rosa) at an average installed cost of $5.65/W, down from an average of $7.25/W. This represents an overall price decline of $1.60/W (more relevant than Task 4.0).

[1] Numbers based on California Solar Statistics database as of March 2013. Jurisdiction of Alameda is a municipal power district and therefore not included in the CSI data. www.gosolarcalifornia.com. The data shown covers the period of 2007 through March 2013.

Individual Team Member Accomplishments

SolarTech

Marianne Walpert, Executive Director
David McFeely, Principle Investigator, Director of Grants and Government Programs

SolarTech was the fiscal agent and provided the financial operational backbone of the team. Programmatically, SolarTech provided the leadership, guidance, structure, context, production standards and promotional support at a national level for the entire team:

- Kick off with the SolarTech Leadership Summit to over 300 attendees.
- Produced 9 webinars to promote the team's goals and successes; and including cross collaboration with the CCSE team and the Contra Costa Economic Partnership team.
- SolarTech enabled and guided the production of three regional symposiums to showcase the successes of the individual teams to the local business community and civic leadership.
- Connected individual team successes to publication opportunities within the DOE.
- Provided linkage and liaison between the SolarTech ESMP team and the other California rooftop teams and including a couple of mid-west teams. Drove quarterly meetings with the California Rooftop teams to share best practices.
- SolarTech's originally proposed SOPO to lead in state-wide dissemination of best practices was modified by the DOE to focus on the Bay Area. SolarTech drove the delivery of three regional symposiums, February 1st, San Jose; February 6th, Berkeley; February 6th, Marin.
- SolarTech also worked with the Contra Costa team to co-produce a Finance webinar on January 9th; and with the CCSE team to co-produce an Interconnection webinar on January 25th.
- SolarTech contributed to and participated in the California Governor's Office of Planning and Research "Solar Permitting Guidebook."
- SolarTech finalized the compilation of all ESMP work into a single compendium of best practices referred to as the "Toolkit" in the SOPO Task 1.3 for California state and National dissemination through the SolarTech website, and the solar 3.0 website.
    - Red Tape Resources
- SolarTech managed all sub award recipients to submit their best estimates to the market assessment portal, solarmetrics.nrel.gov, by the deadline achieving a 10% improvement before the majority of developments were online.

The following permitting results for the North Bay jurisdictions complements the original work begun in 2009 and adopted by the International Code Council Tri-County Chapter (TUCC) version of the SolarABCs Streamlined Process in 2010 in the South Bay, and the online interoperability XML standard for permitting and interconnection published in 2010.

Solar Sonoma County

Alison Healy, Executive Director
Erin Lannon, Project Manager

SSC's work on a county-wide, standardized permit for solar installations was a major breakthrough for the advancement of solar in the County. Over a 5-month period a permitting committee, (Task 1.1, 1.2) made up of AHJ's, manufacturers and contractor representatives, held regular meetings and developed consensus on the new Residential Rooftop PV Guidelines based on an existing form developed by the Redwood Empire Association of Code Officials (REACO). In September of 2012, all jurisdictions in Sonoma County adopted the revised Residential Rooftop PV Guidelines. The new Guidelines include the following changes and improvements:

- Usability enhancements - new electronic editable pdf form, layout improvements;
- Efficiency improvements - worksheet additions include system performance and signage for AC/DC disconnects data;
- Clarifications - more extensive details for site plan and drawings;
- Fulfilling fire official requirements - emphasis towards standardization and safety
- Reacting to installation trends - project size, removing the 5KW cap, and emerging technology (e.g. microinverters)
- Providing all information on SSC's website so that each jurisdiction with their guidelines and documents are hosted in one location;
- Reducing the permit checklist by four pages;
- Removal of a fire and building permit requirement, formerly required by the City of Santa Rosa.

- Independent program evaluations by SSC staff indicate that Sonoma County at its current annual rate of installation (4,400) will save at least $2,706,000 per year from these changes. The annual savings is based on independently conducted analysis of the installation community by SSC staff estimating a savings of $604/permit on average. For the county of Sonoma the evaluated installation costs dropped from $7.05 to $5.51 for a savings of $1.54/W on average. Other substantial changes are difficult to calculate such as hours saved per permit by posting fire guidelines electronically and saving of an average of 13 hours per year per installer by having standardized forms.

- Cross-training has long proven to be an important element in the permitting and inspection world. Often times many impediments to efficient permitting and inspection can be removed just by providing current electrical and structural code update training to both integrators and building officials. SSC provided four such training events to the North Bay region leveraging known industry experts in electrical, code and fire code issues.
- Stepping into the customer acquisition arena, SSC pioneered the re-vamped Clean Energy Advocate program and the Quality Assurance Program for consumers.

The purpose of Clean Energy Advocate (CEA) is to provide a free multi-faceted, independent, and unbiased advocacy program to assist residential and commercial property owners in evaluating the feasibility of renewable energy, energy efficiency, and water-use efficiency upgrades and navigating through the bid, financing, and installation process.

CEA addresses a significant market barrier, which is a lack of unbiased, non-commercialized education and assistance for property owners in determining their options for pursuing solar and energy efficiency projects. CEA is offered as a free service to Sonoma, Marin and Napa County property owners. To date the CEA program has produced 140 free solar assessments which have produced five commercial installations and three residential installations. These installations are estimated to be valued at $1,700,000.

Solar Sonoma County's (SSC) Quality Assurance Program (QAP) was created to provide Sonoma County property owners with a consolidated list of solar contractors who meet certain eligibility requirements for delivering high quality solar power installations and energy efficiency retrofitting services. This list is readily available and accessible on SSC's website. It is also a way of referring business to local, qualified solar contractors. To date more than 400 leads have been generated for members this year.

There are a number of components that work together to make the QAP a successful program. Most notably, the QAP was designed to go hand-in-hand with Solar Sonoma County's Clean Energy Advocate Program (CEA). Currently, the basic components of the CEA program are:

- Marketing, outreach, information, and assistance to consumers – both residential and commercial property owners and business owners.
- Marketing, outreach, information, and assistance to contractors, vendors, and suppliers.
- A Quality Assurance Program (QAP) for contractors.
- Free Solar Assessments for consumers.
- Connecting consumers with contractors, vendors, and suppliers.

There is great value, both to property owners seeking to install solar energy and/or make energy efficiency improvements, and to contractors themselves in maintaining a list of qualified, experienced, trustworthy contractors who can be called upon to provide such services. It adopting this Quality Assurance Program for solar and energy efficiency (and potentially other) contractors, cities and counties will be able to advance the spread of renewable energy, and increase the integrity of the industry.

CEA & QAP are implemented and operating with Sonoma County, and are currently expanding into Napa and Marin Counties. Implementation guides have been produced to help other communities start similar programs.

The CEA & QAP developments are key model programs that will be piloted in the South Bay if the Rooftop Challenge II proposal is awarded, and are a key element of the Solar 3.0 AHJ Outreach.

Sonoma County was one of the first county-wide Residential PACE programs. Therefore it made sense for SSC to draft an overall Solar PV Financing guidebook. This comprehensive guide is intended to assist community leaders, lenders and solar contractors in better understanding this complex subject and which financing instruments might better serve their local community.

SSC also produced a separate guide book based on their experience with Community Choice Aggregation.

SSC contributed and participated in the California Governor's Office of Planning and Research "Solar Permitting Guidebook."

These successes were presented by Alison Healy, SSC Executive Director, at the Solar 3.0 Workshop during the ASES conference the week of April 15, 2012 in Baltimore.

East Bay Green Corridor

Carla Din, Director of EBGC

EBGC's work on a nine jurisdiction-wide, standardized permit for solar installations was a major breakthrough for the advancement of solar in the East Bay Region. Over a 9-month period a permitting committee, (Task 1.1, 1.2) made up of AHJs, sustainability managers and industry representatives held regular meetings and worked towards consensus on the new Residential Rooftop PV Guidelines based on the general "Standard Plan" guidelines developed at the Governor's Office, and augmented with innovative structural guidelines. All jurisdictions in the East Bay will be working towards adoption through their various processes, whether administrative or through city councils for final adoption. When finalized, the new Guidelines will include the following changes and improvements:

- A "Rapid PV Permit" Guide that will allow experienced installers to obtain permits quickly and efficiently, with minimum cost for single-family homes up to 10kW
- Usability enhancements
- Efficiency improvements - worksheet additions include system performance and signage
- Clarifications - extensive details for site plan and drawings
- Fulfilling fire official requirements - emphasis towards standardization and safety
- Additionally, in conjunction with major solar firms in the San Francisco Bay area such as Solar City, Zep Solar, Quick Mount PV, Sun Light & Power and the Structural Engineers Association of California (SEAOC), new structural guidelines were drafted for the majority of roof structures in the East Bay to enable faster approval cycles without the need for structural engineering assessments. California building code does not allow the flexibility to modify tables or remove live load, nor does it include structures that are prevalent in the region without analysis by a structural engineer. This effort to clarify and simplify the structural permitting requirements would be valuable to the industry for two reasons:

    1. It would decrease the percentage of projects where costly custom structural

engineering is required, eliminating both costs and permitting delays, and
2. It would reduce the uncertainty about permitting/engineering costs for solar installers

- An informal survey of engineering costs throughout California indicates that potential savings on residential installations for older homes requiring engineering assessments range from about $850 to a high of $3,500.

- Green Corridor's solar permitting web page that will include standardized processes and links to cities' websites for the "front page" application and any standards/requirements unique to the cities.
- Increased awareness of causes for permitting "holdups" in the contractor world. Educated numerous audiences about common problem areas, consequences, solutions and recommended government-industry reciprocal agreements (see Power Point).
- Feb. 6th 2013 Solar Symposium with the theme of "Innovation" in permitting, utility interconnection (PG&E), software, PACE financing, performance validation and emerging technologies. The event expanded the Green Corridor's solar industry network to representatives from Sandia, the Oakland Port (Utility Dept), engineering firms, solar integrators, Marin Energy Authority and Siemens.
- EBGC participated in the California Governor's Office of Planning and Research Solar Permitting Stakeholders' group and contributed to the June 2012 "Solar Permitting Guidebook" http://opr.ca.gov/docs/California_Solar_Permitting_Guidebook.pdf
- Served as a contributor to the May 2012 IREC report, Sharing Success: Emerging Approaches to Efficient Rooftop Solar Permitting that outlines innovative strategies being implemented across the United States to help increase the efficiency of permitting procedures for rooftop solar systems http://www.irecusa.org/2012/05/irec-releases-report-identifying-successful-strategies-for-permitting-solar-rooftop-systems/.

City and County of San Francisco

Danielle Murray, Renewable Energy Program Manager
Jason Barbose, Renewable Energy Project Manager

Since the City and County of San Francisco has already made significant progress on solar market development, their objective was to share lessons learned and best practices with their regional counterparts. To that end, San Francisco developed best practice guides and policy briefs on solar permitting, financing and planning issues. San Francisco also implemented an employee group purchase program, drawing on a best practice first piloted in San Jose.

- San Francisco SunShares "group buy" program is streamlining the purchase process and reducing the cost of installing solar for employees of the City and County of San Francisco (CCSF) and Business Council on Climate Change (BC3) member companies, including the University of California at San Francisco, Blue Shield, and Pacific Gas & Electric Company. Installed cost reductions of over 20% (compared to local average installed costs) were

achieved through the program, with a $3.80/W offering from the selected vendor, REC Solar.

> "REC Solar is able to offer incredibly competitive prices through San Francisco SunShares because the program provides us with quality leads that reduce our customer acquisition costs. These lower soft costs translate into savings we pass on to the program's participants."
> - Emmitt Summers, Senior Director, Sales and Marketing, REC Solar

- Documentation of best practices, including CCSF streamlined permitting process procedures, and aggregation programs including CCSF's Solar@Work and Solar@School initiatives, is providing other communities with the information they need to reduce barriers and costs. In addition to papers, CCSF has provided webinars for other jurisdictions and the solar industry on these topics, which are available on the SolarTech website.
- Focusing a bit more on the streamlined permitting process, CCSF developed a guide not only on the resulting permitting process (one of the simplest and most contractor friendly in the Nation), but also the economic justification and development process that led to the final solar permitting plan satisfying both building officials, civic leaders and local industry. The guide is highly valuable "how to" for other communities considering such programs (how to do Tasks 1.1, 1.2 and 1.3 for solar PV permitting).
- Policy papers on virtual net metering (in collaboration with PG&E) and community shared solar are helping CCSF and other communities and stakeholders reduce barriers to solar adoption for multitenant buildings, renters, and those without adequate solar potential on their own property. San Francisco also co-hosted a follow-on workshop of virtual net metering with PG&E and the CPUC to help clarify program rules and procedures for local installers.
- Participating in Solar Roadmap tool to measure CCSF's progress and identify remaining actions to reduce soft costs in San Francisco, and engage policy makers in solar market development.
- Identification of public policies that address the risk of solar system shading from development on nearby property, including a Solar Access Indemnity Fund.
- CCSF is a leader in Commercial PACE and helped to produce an insightful webinar covering both CCSF's GreenFinanceSF program and CaliforniaFirst.
- All of these developments were documented as guides for other communities to leverage and added to the SolarTech toolbox.

Clean Coalition

Ted Ko, Associate Executive Director
Gary Pett, Program Manager

- Clean Coalition led the utility side of the program working closely with PG&E to first develop two guide books:
  - Interconnection Business Practices Manual, applicable to any IOU or Muni
  - Rule 21 Lite, a streamlined guide based on California's Rule 21 for interconnection, applicable to MUNIs and Coop utilities.
- Two well produced webinars on the above developments
- Working closely with PG&E to identify the management leadership driving interconnection streamlining and help bring the work of those individuals to the public forum as a model practice.
- Clean Coalition worked very closely with PG&E & SMUD to ensure that they were capturing the concerns and expertise of major utilities in the development of the guides.
- Worked with PG&E to document as a "Case Study" PG&E's internal interconnection successes as a "Best Practice" example for other utilities to leverage. Impact illustrated in figure 1.
- This work was presented by Bob Woerner, Sr. Director in Electric Operations, PG&E, at the February 1st and February 6th Rooftop Symposiums; a webinar on January 9th with the Contra Costa County team; and by David McFeely, SolarTech Rooftop Program Director, at the Solar 3.0 Workshop during the ASES Conference the week of April 15, 2012 in Baltimore.

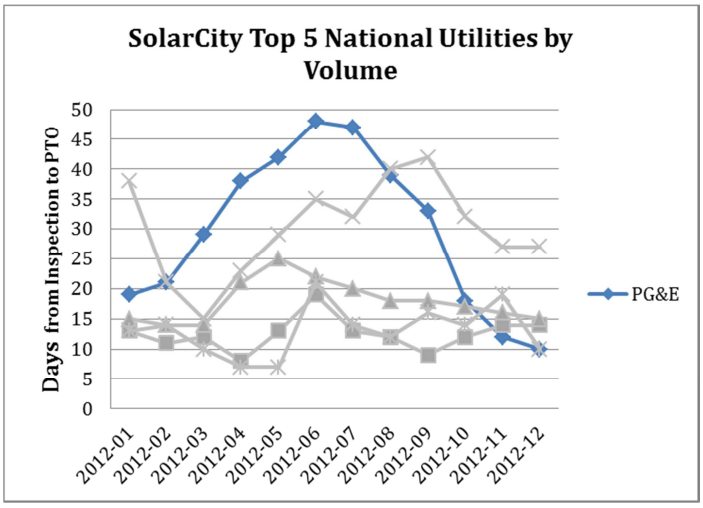

Figure 1, Data compliments of SolarCity, the data shows SolarCity's internal measurement of Permit to Operate (PTO) cycle time. It illustrates PG&E's transition from a significantly long PTO cycle time due to a rapid growth in solar installations to one of the best of the top utilities they work with in just under six months. The story of how PG&E accomplished this feat was documented by Clean Coalition with the assistance of PG&E personnel.

SolarTech Rooftop Solar Challenge: Conclusion and Next Steps

A considerable body of great work was accomplished by the ESMP team in under twelve month. Locally, these successes are already making a difference.

> "I not only benefitted from the work of Solar Sonoma County but also by my involvement in the process. It was also advantageous to participate in the working groups with fire and building officials. It was refreshing to come from a place of doing what is right and moving in a common direction. And on top of all this, Synergy is saving money and time when applying for permits using the new streamlined permit developed by SSC"
> - Jeff Mathias, Synergy Solar

> "It was so critical for Solar Sonoma County to be funded to carry out the work which was only just begun with the Santa Rosa' Solar Sonoma County SAC Grants.. I am so proud of our County which now has tangible metrics to confirm soft costs can be reduced. It is our fondest hope that SSC will receive continued funding to take permitting to the next step."
> -Tasha Wright, Grant Manager, City of Santa Rosa

> "Solar Sonoma County facilitates a unique environment for the development of the solar industry. They provide many opportunities where users, installers, trainers, authorities and manufacturers can get together to share ideas that provide a platform for and facilitate much needed industry consensus."
> - Mark Baldassari, Director, Codes and Standards, Enphase Energy

Great stakeholder feedback, but much more work to do in the ongoing effort to drive down costs and grow the market. The resulting body of RSC 1 work is being compiled into a compendium, which SolarTech refers to as the Soft Cost Reduction "Tool Box." The next phase our mission is to "scale" these successes across multiple communities to grow the solar success footprint. This is already taking place through the Solar 3.0 program that SolarTech manages in collaboration with a host of solar industry participants and partners. In addition to posting this Tool Box on www.solartech.org and www.solar30.org, the SolarTech team will be taking these successes on the national roadshow beginning with the ASES Conference on April 16th.